

# Six cavity test 3.

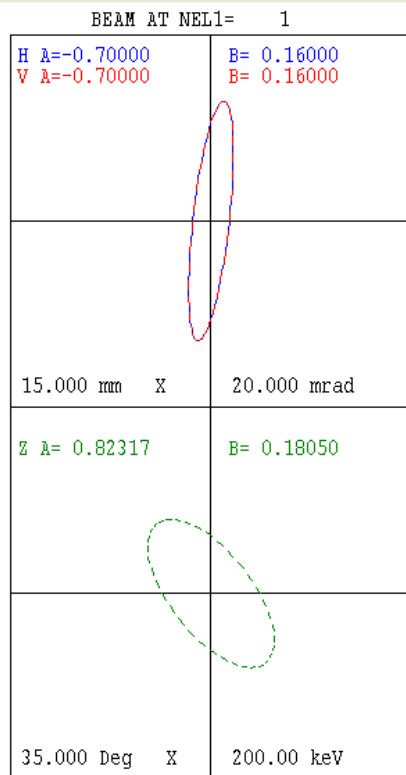
Gennady Romanov

July 2, 2009

## **Iterations**

- Initial design.
- First mechanical layout with real physical lengths of elements with vacuum valve and transformer between RFQ and Buncher 1. Simulations.
- Second mechanical layout. Buncher 1 is placed after quad triplet. Simulations.

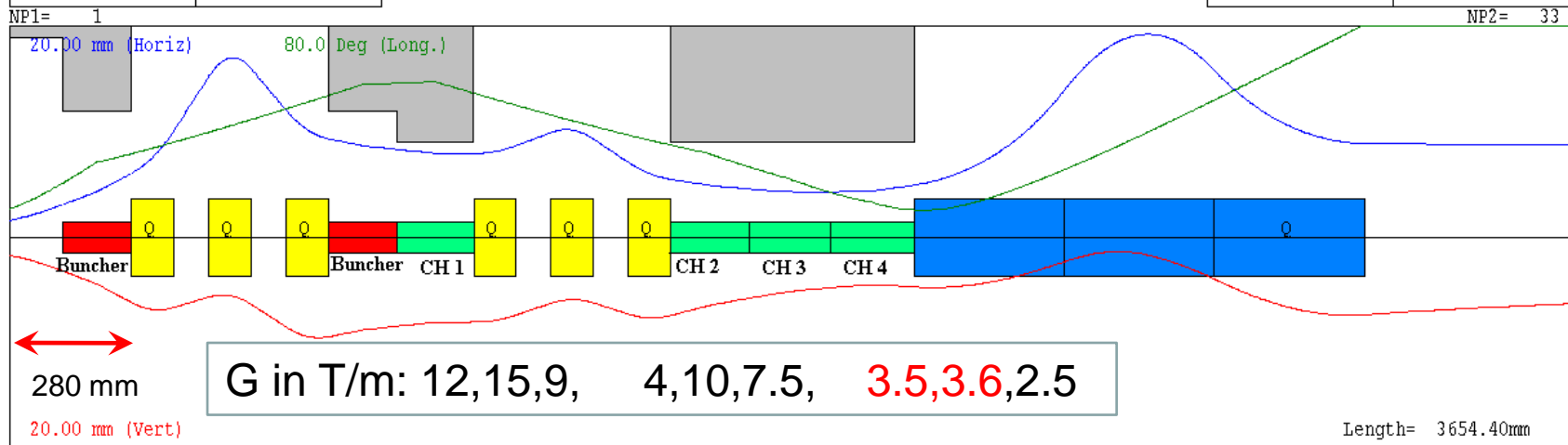
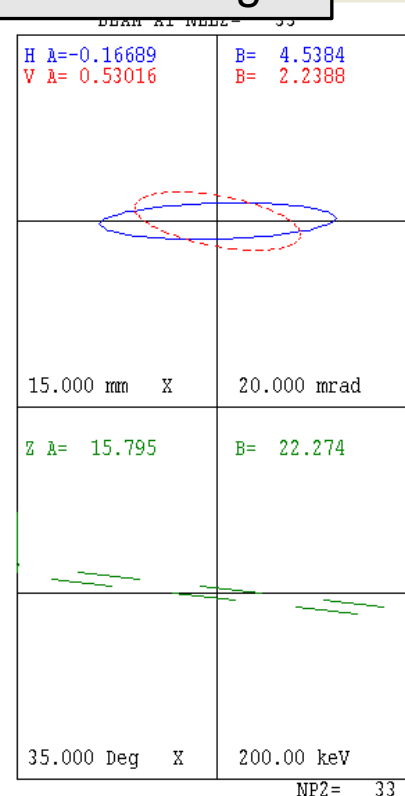
## Six cavities beam test layout. TRACE initial design.



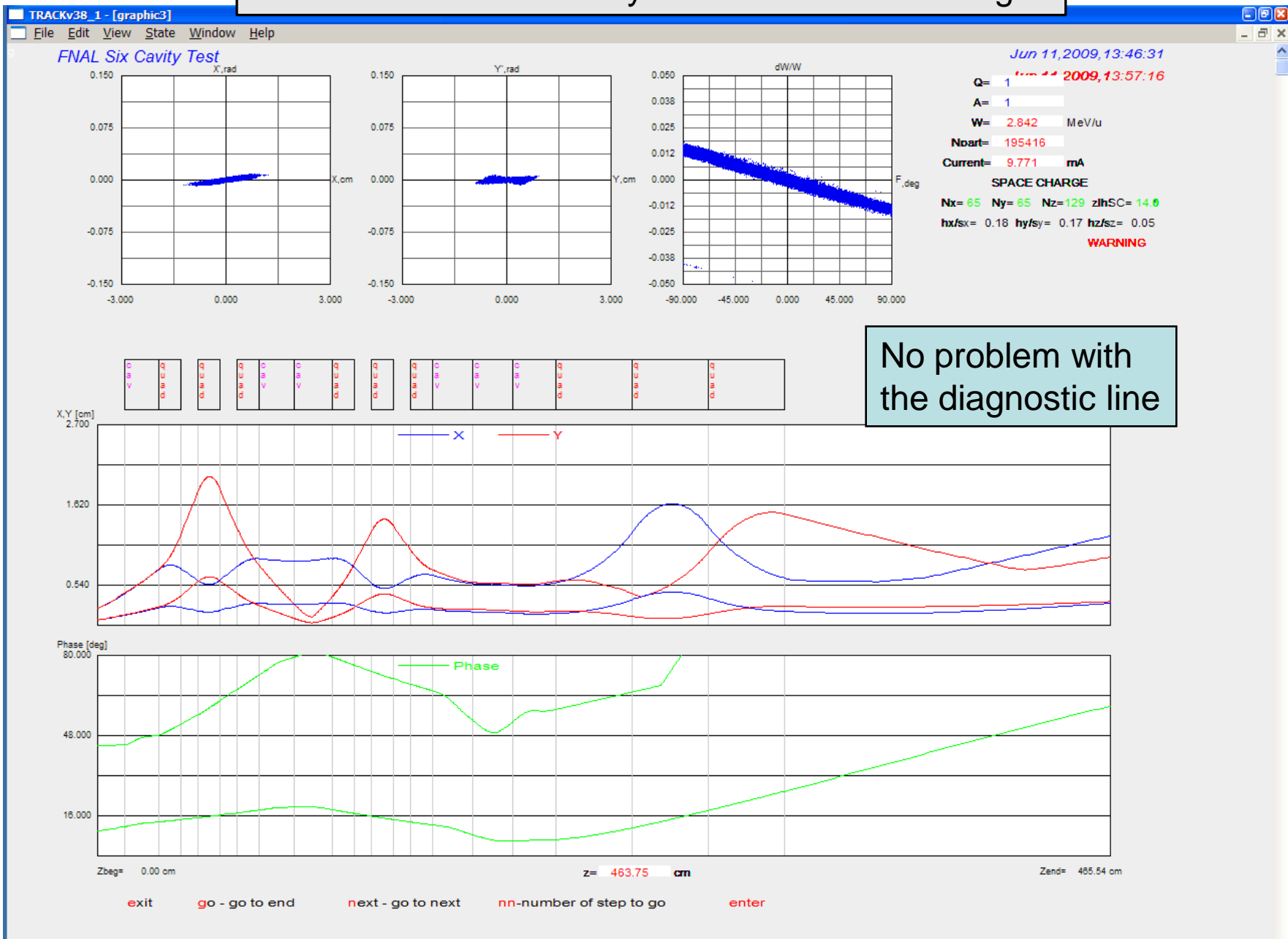
I= 32.0mA  
 $\omega$ = 2.5000 2.6286 MeV  
 FREQ= 325.00MHz WL= 922.44mm  
 EMITT= 17.800 17.800 685.00  
 EMIT0= 17.359 17.359 685.00  
 N1= 1 N2= 33  
 PRINTOUT VALUES  
 PP PE VALUE  
 MATCHING TYPE = 8  
 DESIRED VALUES (BEAMF)  
 alpha beta  
 x 0.0000 6.0000  
 y 0.0000 6.0000  
 MATCH VARIABLES (NC=4)  
 MPP MPE VALUE  
 1 30 3.51430  
 1 31 -3.61984  
 1 33 500.00000

CODE: Trace 3-D v68LY  
 FILE: 6cav test on triplets.t3d  
 DATE: 04/08/2009  
 TIME: 09:02:38

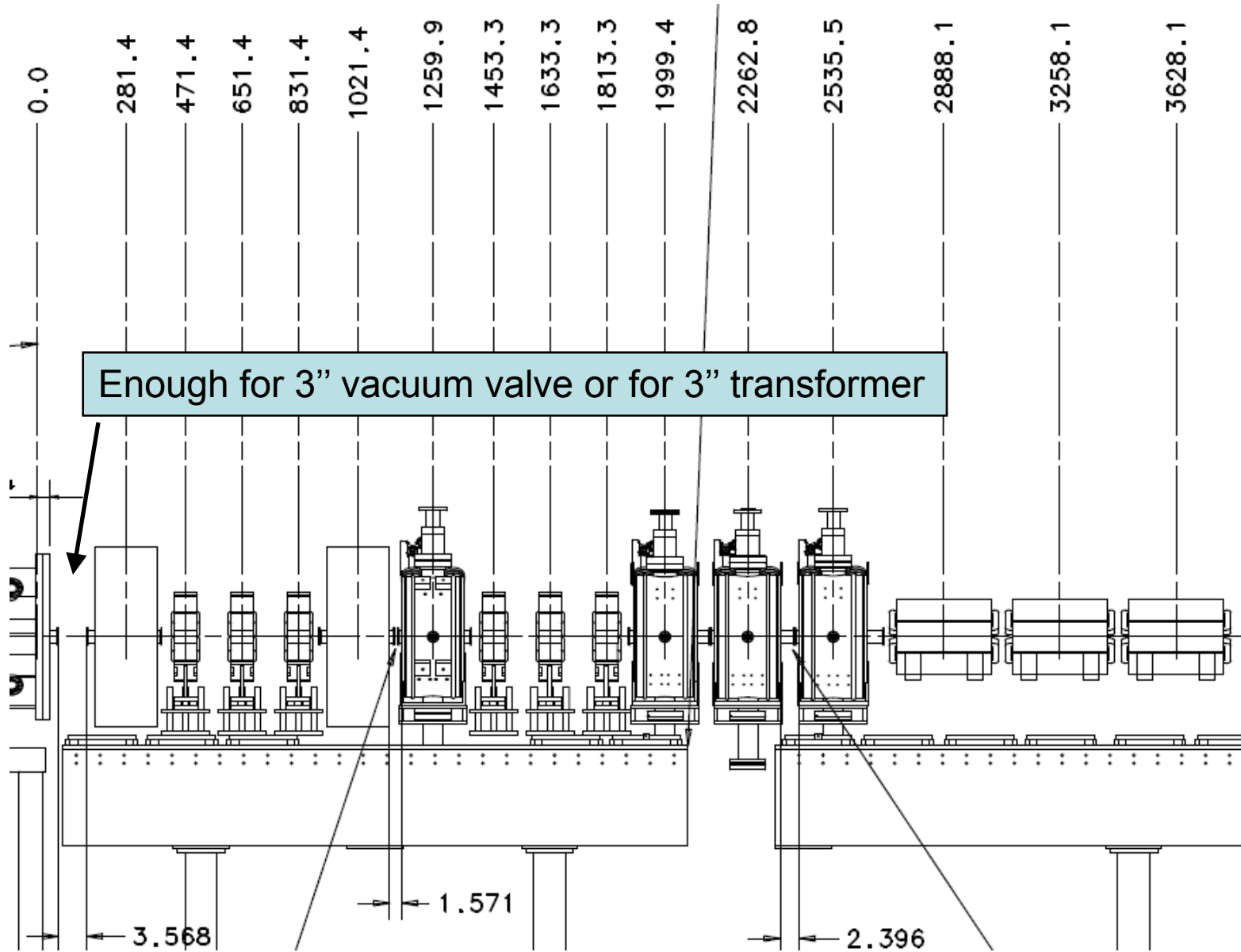
≈Input beam parameters are taken from  
 Jean-Paul's HINS layout simulations



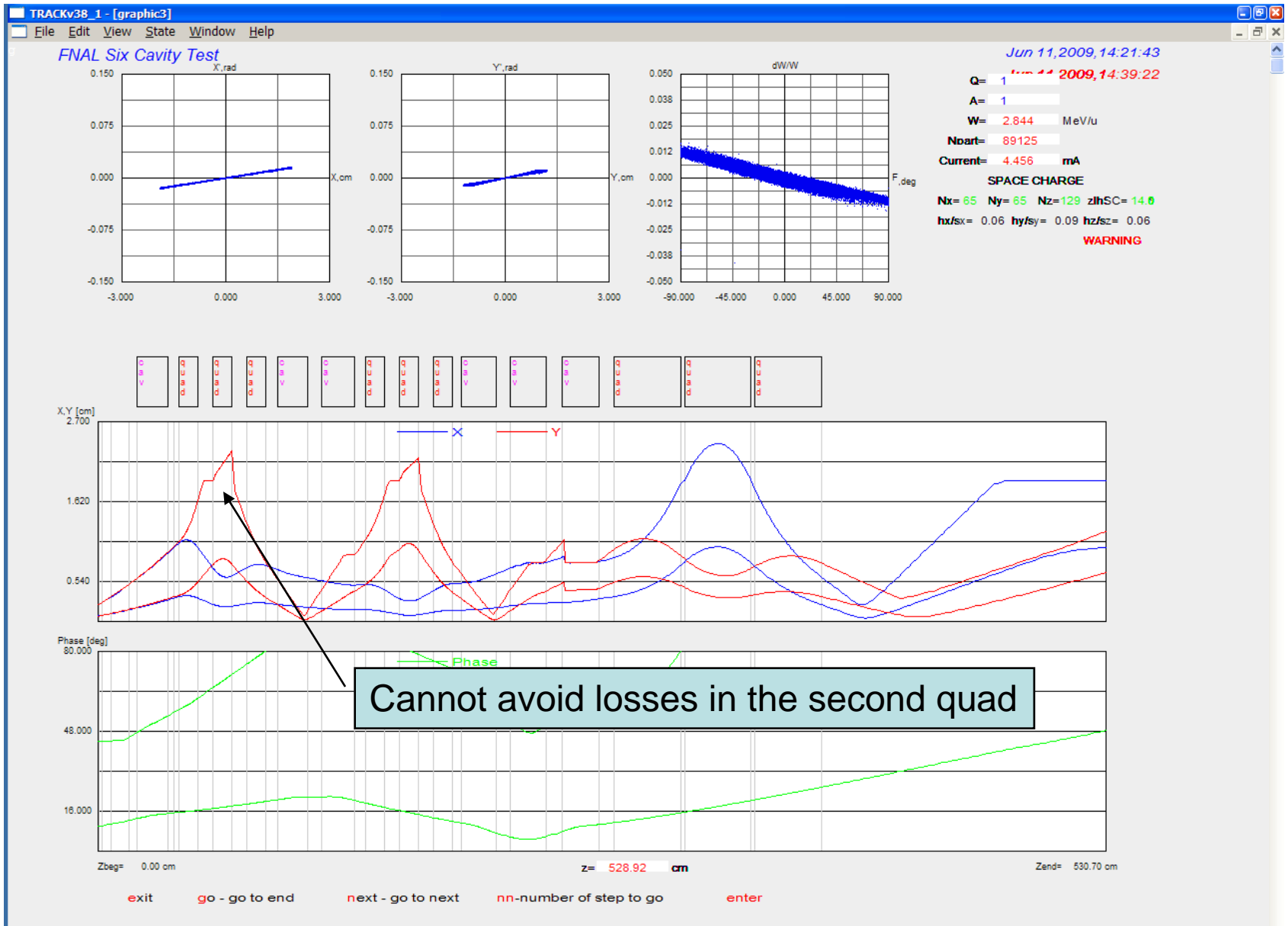
# Six cavities beam test layout. TRACK initial design.



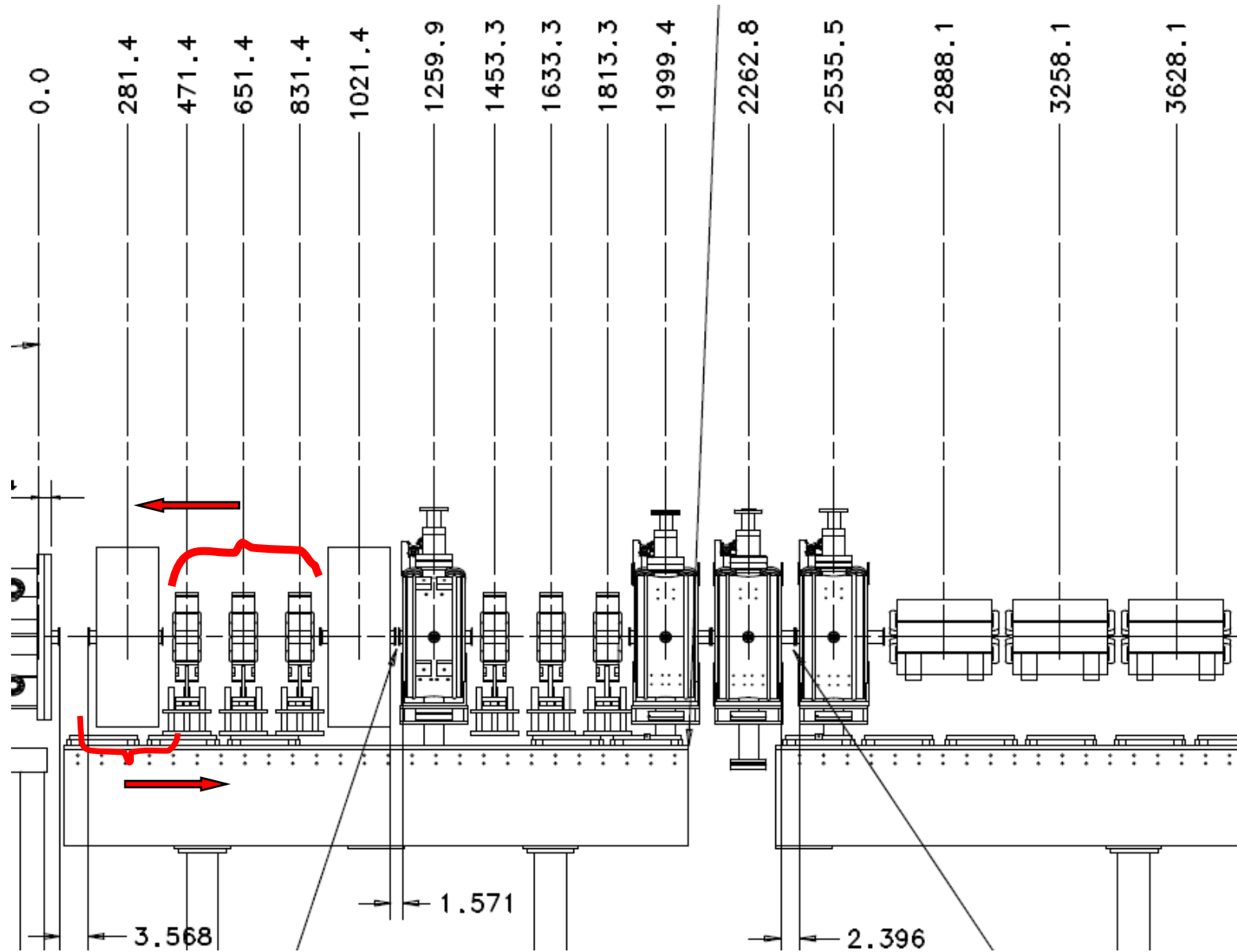
Mechanical layout . Initial design with real physical lengths.



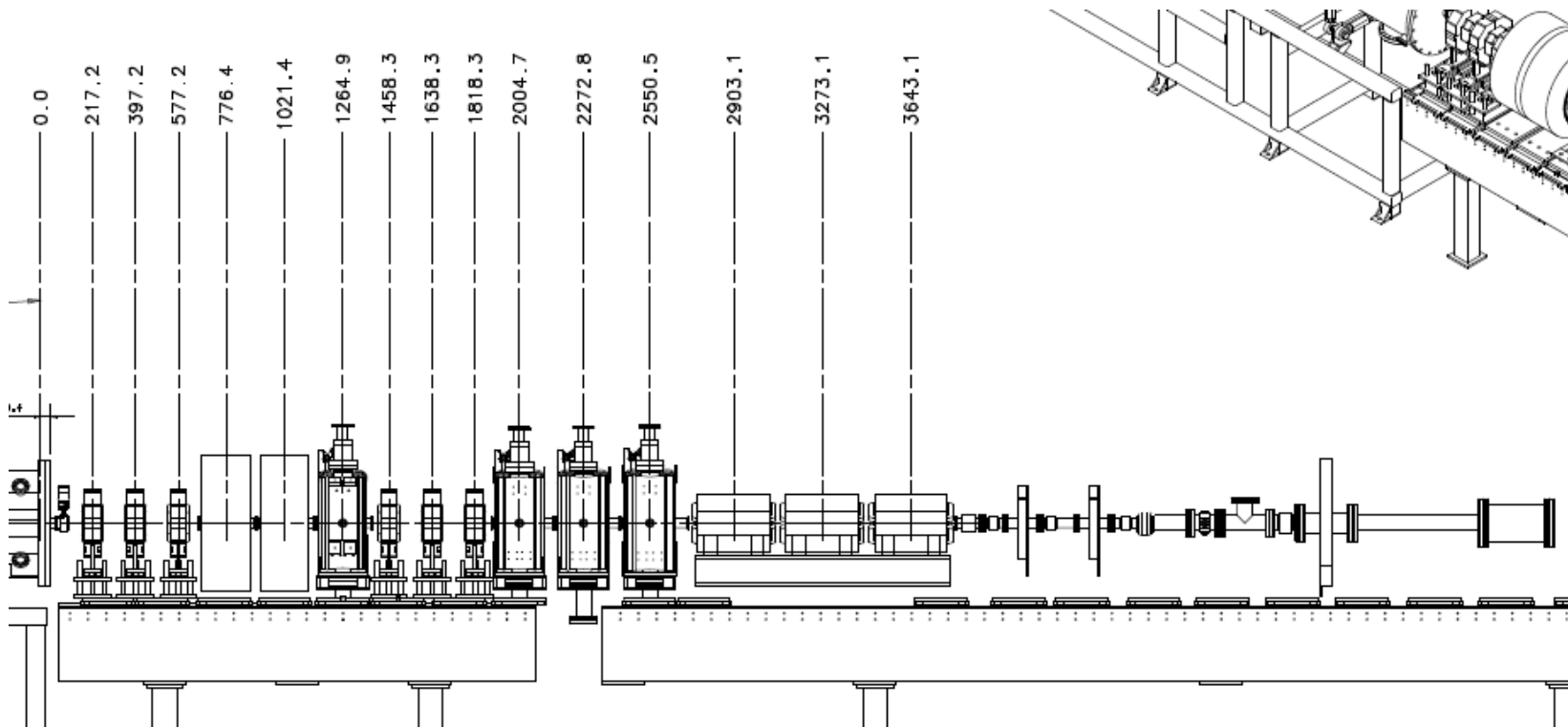
# Initial design with real physical lengths.



## Solution: Switch buncher 1 and quad triplet 1



## New mechanical layout





# New mechanical layout

Jun 18, 2009, 07:09:04

Q= 1 2009, 07:21:18

A= 1

W= 2.854 MeV/u

Noart= 195415

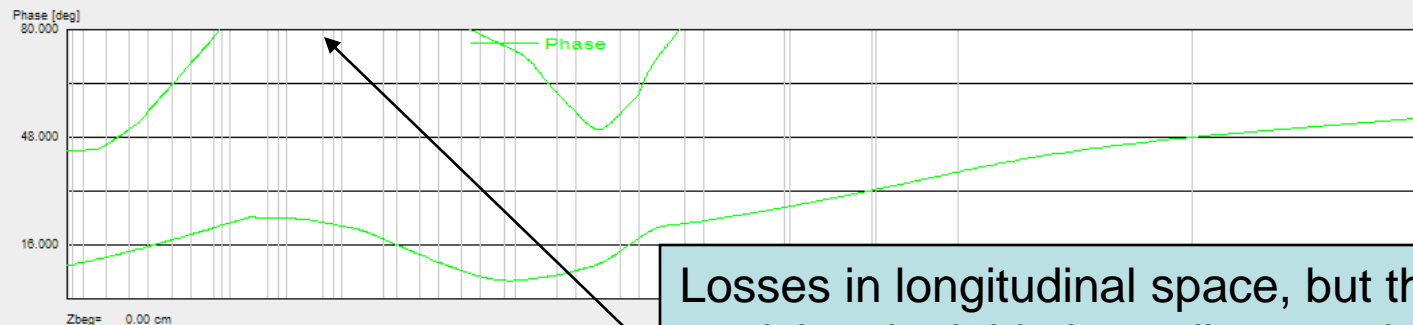
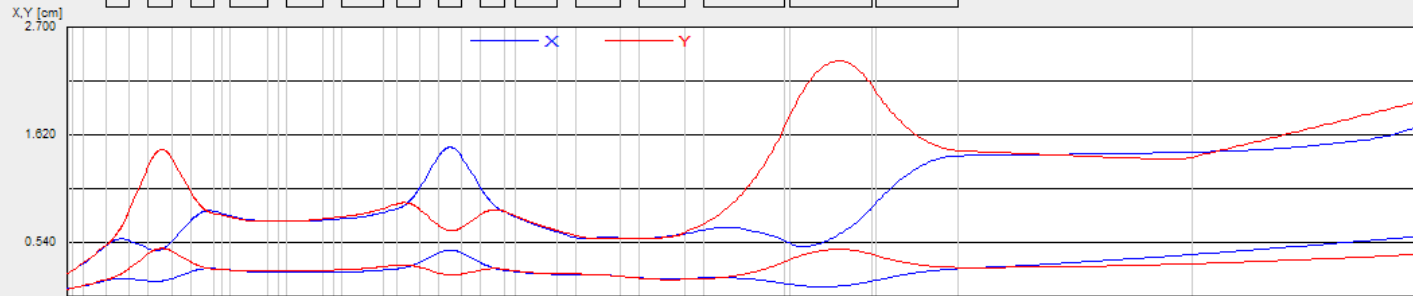
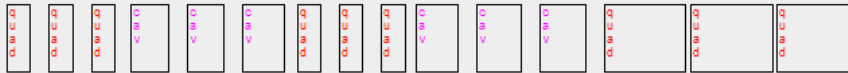
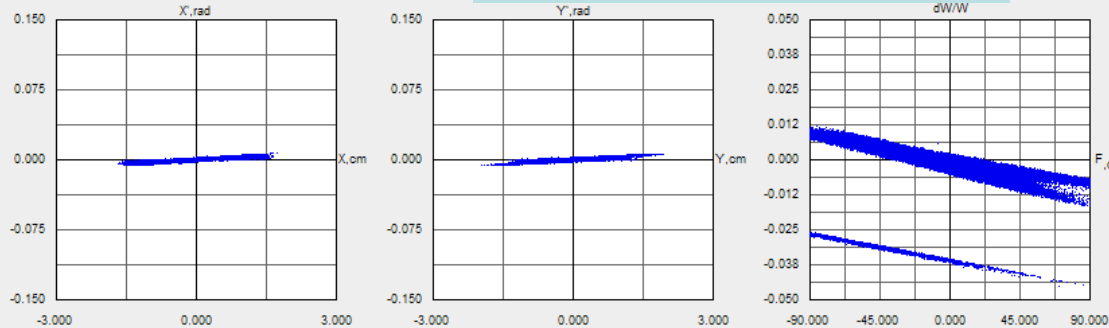
Current= 9.771 mA

SPACE CHARGE

Nx= 65 Ny= 65 Nz= 129 zlhSC= 14.0

hx/sx= 0.20 hy/sy= 0.28 hz/sz= 0.05

WARNING



exit go - go to end next - go to next nn-nu

Losses in longitudinal space, but the particles don't hit the walls yet – they are just lost for acceleration

## Quad gradients, T/m

Quad		Gradient
HE linac	1	12.14
HE linac	2	-15.53
HE linac	3	8.98
HE linac	4	-7.28
HE linac	5	12.14
HE linac	6	-7.04
MI trim	1	2.45
MI trim	2	-2.68
MI trim	3	1.41

## **Next:**

- Maximize acceleration, optimize longitudinal motion (hopefully without changes in the layout)
- Prepare tables for quad gradients and power table for the accelerating cavities and the bunchers